

ABSTRACT

The present invention is directed to compositions and methods related to the synthesis and modification of uridine-5'-diphospho-sulfoquinovose (UDP-SQ). In particular, the methods of the present invention comprise the utilization of recombinant enzymes from *Arabidopsis thaliana*, UDP-glucose, and a sulfur donor to synthesize UDP-SQ, and the subsequent modification of UDP-SQ to form compounds including, but not limited to, 6-sulfo- α -D-quinovosyl diacylglycerol (SQDG) and alkyl sulfoquinovoside. The compositions and methods of the invention provide a more simple, rapid means of synthesizing UDP-SQ, and the subsequent modification of UDP-SQ to compounds including, but not limited to, SQDG.